

## REMARKS

### ***Response to Examiner's Arguments***

The Examiner indicated that Applicant's arguments filed May 25, 2006 with respect to amended claims 1-20 have been considered but are moot in view of the new grounds of objection and rejection.

Applicants have traversed the new grounds of objection and rejection, and have also amended claims 6 and 16.

### ***Drawings***

The Examiner stated that the drawings are objected to under 37 CFR 1.83(a) based on the 35 U.S.C. §112, first paragraph, rejection below.

It is respectfully submitted, as explained below for the 35 U.S.C. §112, first paragraph rejections, that the drawings show every feature of the invention specified in the claims including the "electrically connecting the heat sink to the substrate using a number of bonding wires" and the "attaching the plurality of legs to the substrate" of claims 1 and 11.

### ***Claim Rejections - 35 USC §112***

Claims 1-5 and 11-15 are rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement.

The basis of the Examiner's rejection is that independent claims 1 and 11 claim both "electrically connecting the heat sink to the substrate using a number of bonding wires" and "the heat sink...comprising a plurality of legs...and attaching the plurality of legs to the substrate." The Examiner believes it is mutually contradictory to have a number of bonding wires connecting the heat sink to the substrate and a plurality of legs attached to the substrate because the legs would connect the heat sink electrically to the substrate and make the bonding wires redundant.

It is respectfully submitted that it would be obvious to those having ordinary skill in the art that a substrate is an insulator having conductive portions in different areas to perform printed circuit board type functions.

It is also respectfully submitted that it would be obvious to those having ordinary skill in the art that there are configurations where the legs would attach to areas of the substrate where there are no conductors in the substrate to conduct away heat. Thus, although the legs attach to the substrate, they cannot function as heat conductors. In those situations, the bonding wires act to conduct heat away.

It is also respectfully submitted that it would be obvious to those having ordinary skill in the art that there are configurations where the legs would attach to areas of the substrate where there are no conductors in the substrate to act as ground. Thus, although the legs attach to the substrate, they cannot function to provide ground connections. In those situations, the bonding wires act as ground connections.

It is also respectfully submitted that it would be obvious to those having ordinary skill in the art that there are configurations where the legs would attach to areas of the substrate where there are conductors in the substrate to act as a heat sink but which cannot act as an electrical ground. Thus, although the legs attach to the substrate for heat conduction purposes, they cannot function to provide ground connections. In those situations, the bonding wires act as ground connections.

It is further respectfully submitted that while the configurations are obvious, the solution of having a heat sink with legs and bonding wires connected to the heat sink to cover these configurations is not. The best indication of unobviousness is believed to be the need for the above explanations, which explain the use of the invention.

Thus, Specification page 6, lines 10-11, related to FIGs. 1-4 and Specification page 9, lines 7-8, related to FIGs. 2-4 properly support claims 1 and 11. It is respectfully submitted that nothing in Applicants' Specification is mentioned only in passing. Thus, the drawings show every feature of the invention specified in the claims.

Based on the above, it is respectfully submitted that claims 2-5, which depend from claim 1, and claims 12-15, which depend from claim 11, are allowable.

***Claim Rejections - 35 USC §103***

Claims 16-18, 20, 6-8, and 10 are rejected under 35 U.S.C. §103(a) as being unpatentable over Chung et al. (U.S. Appl. Pub. No. 2004/0183180, hereinafter “Chung” (the ‘180 reference cited in a previous Office action)) in view of Hoffman et al. (U.S. Patent No. 6,737,750, hereinafter “Hoffman”).

The Applicants agree with the Examiner where the Examiner states:

“The ‘180 reference...does not teach a number of bonding wires electrically connecting the heat sink to the dies in the stack.”

The Examiner states:

“Hoffman, in also disclosing a thermally enhanced semiconductor package with a stack of dies (12, 16, Fig. 2) comprising a heat sink (14) between dies in the stack, teaches a number of bonding wire(s) electrically connecting the heat sink 14 to the dies in the stack so as to provide a ground conductive path or other reference voltage to an upper surface 16a of the second die 16 (Fig. 2, col. 5, lines 45-64).”

Claims 6 and 16 have been amended to include bond wires to connect a heat sink to a ground connection in a substrate. The support for the amendment is on Specification page 8, lines 18-19.

It is respectfully submitted that Hoffman does not teach, suggest, or mention the possibility of connecting the heat sink to a ground connection using bond wires.

Based on the above, it is respectfully submitted that claims 6 and 16, and the claims that depend therefrom, are allowable under 35 U.S.C. §103(a) as being patentable over Chung in view of Hoffman because:

“[T]he prior art reference (or references when combined) must teach or suggest **all** the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant’s disclosure.” [Bold for clarity] *In re Vaack*, 947 F2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)

Claims 19 and 9 are rejected under 35 U.S.C. §103(a) as being unpatentable over Chung et al. (U.S. Appl. Pub. No. 2004/0183180, hereinafter “Chung” (the '180 reference cited in a previous Office action)) in view of Hoffman et al. (U.S. Patent No. 6,737,750, hereinafter “Hoffman”) as applied above and further in view of Figs.-12 embodiment of “Hoffman”.

Regarding claims 9 and 19, these dependent claims respectively depend from independent claims 6 and 16, and are believed to be allowable since they contain all the limitations set forth in the independent claim from which they depend and claim additional unobvious combinations thereof.

Claims 11-13, 15, 1-3, and 5 are rejected under 35 U.S.C. §103(a) as being unpatentable over Chung et al. (U.S. Appl. Pub. No. 2004/0183180, hereinafter “Chung” (the '180 reference cited in a previous Office action)).

Regarding claims 1-3, 5, 11-13, and 15, claims 1 and 11 were amended to include the limitation “electrically connecting the heat sink to the substrate using a number of bonding wires”, which is not taught or suggested in Chung.

The Examiner states:

“...the claimed limitation "electrically connecting the heat sink to the substrate using a number of bonding wires", which is absent from the reference, does not produce unexpected results.” [underlining for clarity]

It is respectfully submitted that the Examiner has failed to establish a *prima facie* case of obviousness by applying a standard for obviousness, “unexpected results”, which is not in compliance with 35 U.S.C. §103(a) and MPEP 706.02(j):

“To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in

the prior art and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)."

Under the above, the Applicant is not required to show "unexpected results". If the requirement of "unexpected results" is now required to show unobviousness, Applicants respectfully and timely request that the Examiner provide a case citation or a citation to the MPEP to show this requirement because the CAFC has held:

"[t]he examiner cannot sit mum, leaving the applicant to shoot arrows in the dark hoping to somehow hit a secret objection harbored by the examiner. The prima facie case notion...was intended to leave no doubt among examiners that they must state clearly and specifically any objections (the prima facie case) to patentability and give the applicant fair opportunity to meet those objections with evidence and argument. To that extent the concept serves to level the playing field and reduces the likelihood of administrative arbitrariness." *In re Oetiker*, 977 F.2d 1443, 24 USPQ 2d 1443, 1447 (Fed. Cir. 1992)

Claims 14 and 4 are rejected under 35 U.S.C. §103(a) as being unpatentable over Chung et al. (U.S. Appl. Pub. No. 2004/0183180, hereinafter "Chung" (the '180 reference cited in a previous Office action)) in view of Hoffman et al. (U.S. Patent No. 6,737,750, hereinafter "Hoffman").

Regarding claims 4 and 14, these dependent claims respectively depend from independent claim 1 and are believed to be allowable since they contain all the limitations set forth in the independent claim from which they depend and claim additional unobvious combinations thereof.

### ***Conclusion***

In view of the above, it is submitted that the claims are in condition for allowance and reconsideration of the rejections is respectfully requested. Allowance of claims 1-20 at an early date is solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this

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paper, including any extension of time fees, to Deposit Account No. 50-0374 and please credit any excess fees to such deposit account.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "Mikio Ishimaru".

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